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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,599	01/18/2002	Jong-Dal Hong	43340	4637

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EXAMINER	
JOLLEY, KIRSTEN	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 02/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/050,599	HONG ET AL.	
	Examiner	Art Unit	
	Kirsten C Jolley	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4/30,6/13/.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is noted that the limitations of claim 8 are already required by claim 1, from which claim 8 depends.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is vague and indefinite because line 19 of claim 1 states "wherein the entire above steps are more than once repeated," however the Examples in the specification only disclose that the coating and rinsing steps of materials (A) and (B) are repeated and the first pretreating step (lines 3-5) are not repeated. Therefore, claim 1 appears to be inconsistent with the specification. Clarification is required. For purposes of examination, claim 1 has been interpreted as either repeating the entire claimed process excluding the pretreating step, or including the pretreating step.

It is additionally noted with respect to claim 1 that parenthetical phrases (such as in lines 5, 8, 11-12, 15, and 18-19) are improper U.S. practice and should be deleted.

Claim 2 is rejected as being vague and indefinite because it appears to contradict claim 1. Claim 2 states that the first and second washing steps may be repeated 0 times, whereas line 19 of claim 1 states that all of the steps are repeated (including the washing steps), therefore it is not possible to repeat the washing steps 0 times. If Applicant intends to claim that the washing steps are steps 0 to 3 times *between coating steps*, then such should be specifically claimed.

Claims 5, 7, and 9-14 are vague and indefinite because it is not clear which "layers" are being referred to -- layers of materials (A) and (B), or all layers including the pretreating layer?

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Decher et al. (US 5,208,111) in view of Chabrecek et al. (US 6,589,665) alone, or over Decher et al. in view of Chabrecek et al. and Ushijima (US 5,393,624).

Decher et al. discloses a method of fabricating multilayer polyelectrolyte films comprising the steps of: introducing positive or negative charge to a substrate (col. 4, lines 18-63); applying a material (A) bindable with the material on the substrate; rinsing the substrate after completion of the first coating of material (A); applying material (B) bindable with material (A); rinsing the substrate after completion of the second coating of material (B); and repeating these steps multiple times (col. 11-12). Decher et al. teaches applying cationic and anionic materials (A) and (B) and the rinsing solvents by immersion; Decher et al. lacks a teaching of applying materials (A) and (B) and rinsing solvents by spin coating.

Chabrecek et al. discloses a process similar to that of Decher et al. comprising depositing alternatively charged polyelectrolyte bilayers on a substrate surface and rinsing the layers between deposition steps. Chabrecek et al. states in col. 6, lines 50-63, "The formation and application of the bilayers on the bulk material surface may be accomplished according to processes known per se. For example, the bulk material is immersed in a solution of the anionic and cationic polymer, or one or more layers each of the anionic and cationic polymer are successively deposited on the modified bulk material surface, for example by ... spin coating ...". Therefore, Chabrecek et al. discloses that it is known in the art that spin coating is a known equivalent to immersion for applying oppositely-charged polyelectrolyte coatings on a substrate.

It would have been obvious for one having ordinary skill in the art having seen the references of Decher et al. and Chabrecek et al. in combination to have performed the coating steps of Decher et al. by spin coating instead of immersion since Chabrecek et al. teaches the equivalence of spin coating and immersion to apply oppositely-charged polyelectrolyte layers on a substrate surface. The test of obviousness is not express suggestion of the claimed invention in any or all references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them. *In re Rosselet*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965); *In re Hedges*, 783 F.2d 1038. Further, the Examiner notes that it is well known in the spin coating art to rinse coated substrates using a spin coating technique if the coating has been applied by spin coating for efficiency and economic reasons (i.e., the substrate is already present on the spin coating apparatus).

With respect to the spin speeds and spin times, the Examiner notes that it is well known in the spin coating art that the spin speed and length of time of spinning is a cause-effective variable which directly affects the thickness and uniformity of the resulting coatings. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Alternatively, the prior art of Ushijima is additionally cited for its teachings that it is well known in the spin coating art to rinse substrates using spin coating techniques (col. 8, lines 23-25), as well as the fact that spin speeds and times directly affect the thickness of coatings (col. 3, lines 60-66 and col. 11, lines 14-19). It would have been obvious to one having ordinary skill in the art, upon seeing the reference of Ushijima, to have performed the rinsing step using the same

spin coating apparatus, and to have controlled the coating thickness via the spin speed and spin time, since Ushijima teaches that both steps are conventional in the spin coating art.

As to claim 3, in the spin coating art coating materials are typically applied by dropping or spraying onto the substrate surface during spin coating operations. As to claim 4, it is known in the spin coating art that a coating material may be applied by immersing the substrate in the coating solution followed by spinning for the purpose of uniformly spreading the coating material on the substrate surface. It would have been obvious for one having ordinary skill in the art to have selected one of the above conventional methods for introducing the coating material onto the substrate surface with the expectation of equivalent and successful results.

As to claims 5 and 9-11, materials (A) and (B) of Decher et al. are bound to each other by electrostatic ionic bonding. As to claim 7, materials (A) and (B) of Decher et al. are different organic layers alternatively laminated.

As to claims 6 and 12-14, the spinning speed control is known to affect the thickness of the coatings as discussed above. Additionally, Decher et al. teaches that the solution concentration also affects the thickness in col. 10, line 65 to col. 11, line 6. It is noted that Chabrecek et al. discloses that the addition of ionic salt (and thus pH) also affects the thickness of the polyelectrolyte coatings (col. 7, lines 52-60).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ferguson et al. (US 6,022,590) is cited for its teaching of alternating organic/inorganic multilayer coatings. Laguitton (US 2003/0003272) and Qiu et al. (US

2002/0086160) are cited for their teachings of multilayer polyelectrolyte coatings. You et al. (US 6,225,240) is cited for its teaching of how spin speeds and spin times affect coating thickness and uniformity.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

Kirsten C Jolley
Patent Examiner
Art Unit 1762

kcj